NOTES ON THE "COMMON NIGHTSHADE" (*SOLANUM NIGRUM* LINN.) AND SOME CLOSELY RELATED FORMS AND SPECIES THAT HAVE BEEN CONFUSED WITH IT.

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(Plates xxx.-xxxiii.)

As far back as 1797, a common weed in Europe, popularly known under the name "Common Nightshade," was classified by Carl von Linné (**47**) under the botanical name of *Solanum nigrum*. Since that time, a number of forms or species, which have some superficial resemblance to the European species, have been mistaken for this plant by some authors, while others have recognised the differences, and have given them distinctive specific names.

A few of the most noteworthy species that have been confused with *S. nigrum* are as follow:—

Solanum guineense Lam. (Guinea Nightshade).
,, *hirsutum* Dunal (Hairy Nightshade).
,, *incertum* Dun. (Uncertain Nightshade).
,, *humile* Bernh. (Humble Nightshade).
,, *Forsteri* Seem. (Forster's Pacific Island Nightshade).
,, *astroites* Forst.
,, (*oleraceum* Dun.) (Herb-like Nightshade).
,, *opacum* A.Br. (Dull Nightshade).
,, *nodiflorum* Jacq. (Nodding Nightshade).
,, *pterocaulon* Dun.. (Winged Nightshade).
,, *miniatum* Bernh.
,, *rubrum* Mull. (Red-berried Nightshade).
,, *villosum* Lam. (Yellow-berried, villous Nightshade).

In addition to the above, quite a number of distinctive botanical names have been recorded, which appear to apply to the same plants, so that the synonyms are very numerous, as

will be seen by referring to the list I have drawn up in the following pages. Although Lamarck(46), Miller(61), Persoon(66), Aiton(1), Link(46a), Don(20), and other botanists in the early days, regarded the plants as belonging to distinct species, and have recorded them under the names mentioned on the preceding page, we find that C. B. Clark(17), Bentham(11), Hooker(41-42), and other authorities, who have studied these plants in the Kew Herbarium, have united them under one species, namely, *S. nigrum*, so that we find upwards of fifty specific names recorded in botanical works which, according to the latter authorities, belong to one and the same species.

In Australian botanical works, the various authors have adopted the nomenclature of Bentham, so that the plants commonly known to Australians as "Native Black Currants," are known in botanical works under the name *S. nigrum* Linn., which, in Europe, is referable to the "Common Nightshade."

In view of the numerous reports, received from various parts of the Commonwealth, of animals, and even children, being suspected to have been poisoned through eating the berries of these plants, while others state that the berries make an excellent conserve or jam, it seems desirable that the various plants should be more carefully examined and investigations made in the light of more modern knowledge. Tests should be made of the distinctive forms, so as to prove whether the plants are deleterious or not. We know that there are at least three distinctive forms found in Australia, which are easily recognised by the different habit, colour of foliage, and other distinctive characters; and that there are still others which have been introduced from other countries, which are easily recognised as distinct from those growing wild in Australia, in that their berries are distinctly of a reddish or yellowish colour, while those of our forms are of varying shades of black or purple. Even as far back as 1868, it was pointed out by Woolls(78) that we have in Australia two distinct forms of what is commonly known here as "Native Black Currants." His remarks are recorded as follows:—"Solanum seems to have two varieties here. The one is indigenous; the

other is identical with the European plant, and has probably come here with English seeds. It is remarkable that the children eat the berries of *S. nigrum* with impunity." The late F. M. Bailey, C.M.G., Colonial Botanist of Queensland, has also noted two distinct forms, as will be seen by his statement which I will give further on. Mr. C. T. Musson, in submitting specimens to the National Herbarium for determination, has also drawn attention to two distinct forms. In studying the plants in the field, as well as the numerous herbarium-specimens contained in the National Herbarium Collection from a large number of localities in Australia and the Pacific Islands, it seems to me that we have at least three species which may be regarded as indigenous, and easily recognised as distinct from the European species. As stated above, a variety has been recorded for Queensland by Bailey (5, 6) under the name *Solanum nigrum* var. *humile*, but whether this is the same as *S. humile* of Bernhardi (12) or of Lowe (50), I am not at present in a position to state, as I have not had an opportunity of examining the living plants in Queensland. It would appear, however, that the plants mentioned by Bailey, are different from those quoted by Lowe from Mogador, as the latter are described as being "very like *S. nigrum* L., but of humble growth, with smoother, somewhat smaller leaves, and waxy-looking, pale, dull ochre-yellow berries."

If we review the various statements made in connection with the poisonous or edible qualities of the plants recorded under the name *S. nigrum*, it will be found that the evidence is very conflicting, and that it is highly necessary to examine each form of the so-called species separately, so as to be able to say whether the berries of the decumbent plants are poisonous, and those of the upright form are not, or *vice versâ*, or if both forms are equally bad.

For the benefit of those who may be interested in the subject as to whether the berries may be utilised as food for animals or as a conserve or jam for human beings, I have gathered together the following statements, which will give some idea as to the different opinions.

In a letter to Sir Joseph Hooker in 1864(42a), Mr. W. S. M. D'Urban, F.L.S., states that "*Nicandra physaloides* and *Solanum nigrum* are abundant in British Kaffraria in gardens. The soldiers stationed in the colony often eat the black berries of the latter, and they appear to be innocuous." Then we have reports from Messrs. W. Kyle, Inspector of Stock, and Graham Mitchell, in relation to the mortality among Mr. Dutton's cattle at Broadmeadows, in Victoria; also a report from Mr. W. Johnston, Analytical Chemist, on the analysis of the stomach of one of the dead cows; and from Mueller upon the properties of the plant to which the deaths are attributed. All these reports agree in the opinion that the mortality is owing to another form of poisoning, caused by the feeding on *S. nigrum*, commonly known as "Annual Nightshade." In a further report, Mueller(62) published the following remarks, together with a figure of the plant: "the herb which produced poisonous effect on the cattle of Broadmeadows is the *Solanum nigrum*, called in Britain the 'Annual Nightshade'." It is a cosmopolitan plant, since ancient times known as poisonous, and mentioned under the name of Strychnos along with *Atropa belladonna* in the writings of Dioskorides already, it belonging, indeed, with the Belladonna, Madragora, and Stramonium, to the same Order of plants (Solaneæ). The most active principle of *Solanum nigrum* is a glucoside (Solanin), and this is most strongly developed in the unripe berries. The plant, however, acts not with the dreadful intensity of the deadly Nightshade (*Atropa belladonna*), but it is far more commonly dispersed, and disseminates itself with celerity, particularly on road-sides, waste places, in gardens, &c. It being, however, an annual, it can be readily enough destroyed by weeding prior to its ripening its berries. The solanin produces paralysis of the extremities prior to death when consumed in quantity."

Bailey and Gordon(7) made the following statement about the plant:—"Small Black Nightshade (*Solanum nigrum*) . . . . . White flowers are succeeded by usually black berries, but in the more downy plant often greenish; this latter form has often a

more prostrate, spreading habit, and is considered to possess more poisonous properties. A world-wide weed. This widespread weed has very frequently been brought under notice as poisonous both in this and in other colonies. Some years ago it was reported to have poisoned a number of cattle in Victoria, and those appointed to inquire into the matter gave it as their opinion that the deaths occurred from this cause. The evidence, however, as to the fruit being poisonous is very conflicting. It has been asserted that children have been poisoned by eating the berries raw, but cooked they may be partaken of with impunity. There are two forms of the plant met with in Queensland, as before stated, and in all probability the more straggling form with greenish berries is the dangerous kind, and probably, as has been asserted, the plant may possess more or less poisonous properties according to the soil upon which it is grown; thus it may be most dangerous when growing on rich soil, rubbish-heaps, &c., and perhaps quite harmless when growing upon dry, poor soil, enjoying the full rays of the sun." In a subsequent publication, Bailey(5) makes a statement as follows:—"There are two forms of this plant in Queensland, the one nearly glabrous, which has an erect growth; the other having a somewhat procumbent habit and clothed with a glandular pubescence. This latter is sometimes called var. *humile*; its fruit is of a somewhat greenish-yellow, and when we hear of children being poisoned from eating the fruit of this species, it has probably been the fruit of the latter variety that has caused the mischief. The herbage of both varieties is considered poisonous to stock. It has, however, been used both here and elsewhere as a substitute for spinach." Dr. Aitchison, in writing on the Botany of the Afghan Delimitation Commission, states(2) "that *Solanum nigrum* grew in quantity, and was employed as a pot-herb by the camp followers."

In a list entitled "The supposed Poisonous Plants of West Australia," Mr. F. Turner(73) gives *Solanum nigrum* L., "Nightshade," together with a brief description and the following remarks:—"Flowers small and white, arranged in little cymes. These are succeeded by small, globular berries, usually nearly

black, but sometimes greenish-yellow or dingy red. The forms that bear the two last coloured fruits are considered the most dangerous. The black-coloured berries are frequently eaten by children."

In the Western Mail for April 30th, 1911, it was reported that two children (a girl 3½ and a boy 6 years of age) at Bunbury, W.A., ate some berries of *Solanum nigrum*, and that the little girl died. Mr. J. H. Maiden, F.R.S., Director of the Botanic Gardens, Sydney, has also made several references to *Solanum nigrum*. The first account appears to be in 1895(**52**), where he states that it is "supposed to be the cause of blindness in horses, particularly young animals, who unknowingly eat the plant." In the Daily Telegraph, May 14th, 1906, Mr. Maiden further states, "I have eaten jam made of the fruits. I do not believe that stock have been poisoned by this plant, and it is one which has often been the subject of special enquiry in regard to this particular plant." This latter statement was made in reply to an enquiry if the plant was likely to have caused the death of some cattle on Daisy Piper's Flat. In a further note on this species, Mr. Maiden(**53**) reaffirms the above statement, as will be seen by the following remarks:—"This widely diffused weed is by some persons believed to be poisonous, by others innocuous. . . . . My own opinion is that it is not poisonous, though it is quite possible that if the fruits be eaten unripe, or if the plant be grown in damp, shady places, it may possess acridity and produce gastric disturbance. The ripe fruits are made into jam in parts of this Colony, and are also eaten by human beings in other parts of the world." Ewart & Tovey(**25**) state that "although useless as a fodder plant, it possesses no virulent poisonous properties, and as a rule stock do not touch it. The plant is commonly regarded as highly poisonous, partly owing to confusion with the "Deadly Nightshade" (*Atropa belladonna*), which is fortunately rare, and partly owing to hasty generalisation. A small amount of solanin is present in the stem and berries of *Solanum nigrum*, but these are usually less poisonous than green potatoes, in which alkaloids also appear. In addition, stock do not touch it at all unless starved. . . . . The "Black

Nightshade" berries are often eaten by children without any ill-effects beyond, perhaps, a stomach-ache, or, if eaten in excess, sickness or purging. They have often been used instead of raisins for plum pudding, with no results out of the ordinary. It is possible that *Solanum nigrum* may develop more solanin in the dry climate of Australia than elsewhere, but, if so, we have no evidence of the fact." In Contributions from the U.S. National Herbarium (**81**), the following statement also appears:— "The common Black Nightshade (*Solanum nigrum*), fig. 78, which occurs somewhat plentifully as a garden weed throughout the district. The berries are used for food, but only when fully ripe. The green fruit is looked upon as poisonous, one case being cited by Mr. C. M. Brown, of Covelo, where, in 1893, a white child was seriously but not fatally poisoned by eating the berries, some of which were supposed to have been unripe. The prominent symptoms were vomiting and spasms." Mrs. V. K. Chestnut (**18**) also gives the following particulars:—"The Black Nightshade is a common introduced weed in rich, shaded grounds and fields east of South Dakota and Arkansas, and in damp places westward of the Pacific Ocean. . . . . The amount of poison present in any part of this plant varies with the conditions of growth The more musky-odored plants are the most poisonous. In some the amount of alkaloid in the ripe fruit and leaves is so small that the parts may be, and are, consumed in considerable quantity without any ill consequences. Poisoning does sometimes follow, but it is not clear whether this is due to improper preparation or to careless selection of the parts used. In Europe cases of poisoning are said to occur in infants over whom the plants are hung to induce sleep. The use of Black Nightshade for food is certainly not to be recommended. Cases of poisoning are recorded for calves, sheep, goats, and swine."

Comparison of Australian Forms with Plants grown from Seed of several Species received from other Countries.

During the years 1913-1916, we have received at the Botanic Gardens, Sydney, by way of exchange, a large number of Solanums, including eleven species of the "Morellæ veræ" group, which includes *S. nigrum* and closely related forms. Seeds of

the different species were sown, and eventually planted out in a plantation in the lower garden for observation and comparison with the plants found naturalised in New South Wales. The plants raised were as follows :—

Solanum guineense Lam. (Plates xxxii. and xxxiii., fig.*d*), (Received from Botanic Gardens, Madrid, Spain).

The plants proved to be fairly robust and rather coarse, reaching a height of about 2 feet or rarely more than $2\frac{1}{2}$ feet, with rather strong branches more or less pubescent, and large, almost entire leaves. Flowers white, with yellowish-brown coloured anthers, and large purplish-black berries, nearly as large as Morella cherries.

Plants identical with the above were also grown in the propagating ground in 1913, from seed received from the Natural History Museum, Paris, France, in May, 1912, under the name *S. nigrum* var. *guineense*. Seeds of the latter were saved by the late Superintendent (Mr. G. Harwood), and were labelled "Burbank's Wonderberry." These were re-sown by the present Superintendent (Mr. E. N. Ward), who had fifty seedlings of the batch planted in unmanured soil in the trial ground in August, 1914. On February 20th, 1915, Mr. Ward submitted to the Director (Mr. J. H. Maiden) the following report concerning them :—"The plants have proved easy to grow, and are wonderfully prolific. Fruit began to set when the plants were only 6 inches high. They are still flowering and setting fruit at 2 ft., which appears to be their maximum height. The fruit is uneatable raw, but excellent cooked, also when made into jam or jelly; in flavour and appearance, when cooked, it resembles an improved English Cranberry. The fruit is firm, making it a good carrier, and is easily gathered. . . . . The plants at first resemble *S. nigrum*, but later are different in many ways, especially in their upright growth as against the partially prostrate growth of *S. nigrum*." I can fully endorse Mr. Ward's remarks that "the plants are easy to grow" and wonderfully prolific, and also his statement that the fruit is firm, making it a good carrier, and is easily gathered, as I have grown several plants from the seeds obtained from the plants grown by Mr. Ward, in

my garden at Ashfield, and at Hill Top, on the Southern Line. I have also had some of the fruit made into jam, but although it had a very nice colour and appearance, somewhat resembling the true black currant jam made from the fruit of *Ribes nigrum*, I must confess that the flavour did not suit my palate. Whether one could acquire a taste for this particular jam, I am not prepared to say, but it seemed to me to have a peculiar taste.

With regard to the name "Wonderberry" being attached to this plant, there seems to be some doubt if the plants grown by Mr. Ward and myself are really the same as those sold by the American seedsmen under that name. Some few years ago, some seeds, reputed to be the true "Wonderberry" of Burbank, were purchased by a leading firm of seedsmen in Sydney, and some of these were sown in the Botanic Gardens, Sydney, for observation and report.

The seeds were sown by Mr. J. L. Boorman on the 4th June, 1909, and a report furnished by him on the 6th of January, 1910, is as follows:—"The Wonderberry sent to the Gardens for testing and for correction in naming according to Mr. Betche, the general opinion of those acquainted with *S. nigrum* all emphatically state it to be merely the normal form of *S. nigrum*, without any appreciable difference from the common introduced New South Wales plant."

As the resultant plants seemed to be so near the plants commonly known in the Sydney District as "Native Black Currants" or Common Nightshade (*S. nigrum*), it was thought desirable by the firm of seedsmen to hold the seed back from sale. On the 6th of March, 1917, I gathered some fresh berries from a solitary plant in my garden at Ashfield, which weighed 2lbs. 6oz.; these were submitted to Mr. F. B. Guthrie, Chemist to the Department of Agriculture, for examination and report as to whether any poisonous properties were present. I received the following reply:—"The sample submitted contains very minute quantities of a crystalline alkaloid, presumably solanine. The quantity obtained from 200 grms. berries was too small to weigh. The crystals obtained were in small groups, were needle-shaped, soluble in alcohol, insoluble in water, and precipitated

by Sonnenschein's reagent. If it is necessary to isolate and purify the alkaloid for identification, it would be necessary to work on not less than 20 to 25 pounds of Wonderberries."

It will be seen from the above report, that the evidence points to solanine being present, so that it would seem to me advisable to discontinue the cultivation of this fruit for edible purposes. Especially when we read in Henry's work ("The Plant Alkaloids, p.434, 1913) that "the physiological action of solanine destroys red blood-corpuscles." It would seem from the following particulars given by Groth(37) that the "Prairie Berry" (*S. nigrum*, form or strain) is apparently the same as *S. guineense*, and that he also regards it as a useful commodity together with two other varieties as follows: – "Red-fruited *S. nigrum aurantiacum*, Green-fruited *S. nigrum chlorocarpum*. . . . . The green-fruited variety has a sweet, pleasant flavour, strongly resembling the 'orange flavour' sold in packages for flavouring cornstarch puddings. It is, however, so soft that it cannot be picked, much less shipped, without mashing. The "Prairie Berry" has an insipid, somewhat disagreeable flavour when ripe, but it makes excellent preserves. It is so tough that it will keep for a month after being picked, and can be shipped to any distance. Both are good bearers. It is likely that sooner or later a plant will appear which will combine all these characters and breed true to them. If so, it will be preserved; but, as stated above, there is no fund available under which systematic work could be done with the object in view of establishing such a desirable type. Such a berry, coming at a season when no other berries are on the market (October), and when coal fires are kept going in the kitchens, would present a preserving berry of great value to the State." In England, a good deal of interest has been taken in connection with the "Wonderberry," as will be seen by the following abstracts.

In the Gardeners' Chronicle, October 31st, p.291 (1901), it is stated that "three forms of *S. nigrum* (including *S. guineense* or so-called "Wonderberry") were sent to Dr. Greshoff, of Haarlem, for chemical investigation, and in his reports he states that all three forms contain solanine—the British form having

the least poison, and the "Wonderberry" the most." A figure of each of the three forms is given, and it is suggested that fig.128, from Mr. Burbank's Wonderberry, is a cross between *S. guineense* and *S. villosum*, the latter a native of the west coast of America, and the former of Guinea, on the west coast of Africa.

A further account is given in Gardeners' Chronicle for December 18th, 1909, p.419, as follows:—"We have received a letter from Mr. J. Lyon Whittle, Town Clerk of Warrington, enclosing a report from the official analyst for the County Borough of Warrington, Mr. Frederick G. Ruddock, F.I.C., on the result of the chemical analysis of the fruits of "Wonderberry" grown in this country from seed obtained from New York. Mr. Ruddock states that he has analysed both the leaves and fruit of this sample of "Wonderberry," making a special search for the alkaloids atropine and solanine; and he is of the opinion that neither solanine, atropine, or other poisonous alkaloids are present in either leaves or fruit of this sample."

Solanum astroites Forst.

Seeds of this were obtained from the Botanic Gardens, Madrid, Spain; and sown under No.31, on 17th May, 1916.

It is a rather soft, herbaceous plant, the leaves being quite entire and membranous. Flowers white, succeeded by greenish berries, which become black at maturity. It was originally described by Forster(**26**) in 1786, from plants collected in the Society Islands by Banks and Solander. Guillemin(**36**) also quotes Forster's species from the Society Islands. Seemann(**68**) gives this as a synonym of *S. oleraceum* Dunal, and states that it was collected on Norfolk Island by Milne, and at the Society Islands by Banks & Solander. The local name, according to Seemann, is "Boro ni yaloka ni gata." Seemann further states, "I have also seen it wild about Sydney," but it seems to me that this is either *S. pterocaulon* or *S. opacum*, as I have not seen any specimens growing wild about the Sydney district that would agree with *S. astroites*. I have closely examined the specimens in the National Herbarium, Sydney, and find that the following may be referred to this species.

New Zealand: One Tree Island, Auckland (D. Petrie; April, 1901), Wanganui (W. A. Allison, 1913).

Norfolk Island (ex Australian Museum, April, 1898; and J. H. Maiden and J. L. Boorman, November, 1902).

Jaluit, Marshall Island (Dr. Schnee, 1902).

Upolu, Samoa Island (Dr. B. Funk, 1902).

New Britain, Bismarck Archipelago (R. Parkinson, 1901).

New South Wales: Broadwater, Richmond River (E. Cheel; September, 1916).

With regard to the plants from Norfolk Island, Mr. Maiden(59) gives the following particulars:—"Common everywhere (A. Cunningham, in Heward). Found by him also on Phillip Island. Eaten by prisoners, who collect and cook the berries of the "Black Nightshade" (*S. nigrum*). The berries are accounted virulently poisonous in England, but their character may possibly be changed by the warmer climate of Norfolk Island." Mr. Maiden(57) also records a *S. nigrum* for Lord Howe Island, and for Pitcairn Island(58); and states that it "springs up wherever land is cleared. It is known as "Black Currants," the fruits being occasionally used for jam, as on the mainland."

In the exotic collection, there are specimens from Philippine Islands, which seem to belong to this species.

Solanum memphiticum (*S. nigrum* var. *memphiticum* Walp.).

Seeds of this were obtained from Botanic Gardens, Madrid, Spain; and sown under No.31, on 17th May, 1916. They were rather tall, and very similar to *S. guineense*, in that the leaves were entire; but the flowers, however, were whitish, with a decided tinge of purple, or, in some, distinctly purplish. The berries are at first green, and become blackish with age, tinged with purple and green, and are not so large as those of *S. guineense*. In Dunal's Monograph(24), this is regarded as a valid species.

Solanum Douglasi Dun.

Seeds of this were obtained from the Botanic Gardens, Madrid, Spain. It was originally described by Dunal in 1852(24), from specimens collected in California by Douglas, in 1833. The

plants grown from the seeds obtained from Madrid are scarcely distinguishable from the next.

SOLANUM OPACUM A.Br.(15). (Plate xxx.; xxxiii., fig.*c*).

Seeds of this were obtained from the Botanic Gardens, Madrid, Spain. The species was described in 1858, apparently from plants cultivated in Berlin, from seeds originally obtained from Australia. The habitat is given in Index Kewensis as Australia, but apparently has been overlooked by Bentham, and by Australian botanists. The cultivated plants are identical with the sub-procumbent form, with pubescent branches and leaves, which is common in many parts of the State, especially in the Port Jackson District. It somewhat resembles the *S. nigrum* of Great Britain, and has probably been mistaken for that species, but the figure in English Botany, t. 566, seems to me quite distinct from any plant in our collection, except one from Eton Hill, Clevedon, Somerset, collected in 1849; and another from Herb. Laurer (Germany) without any specific locality. These two specimens have a superficial resemblance to *S. opacum*. Lowe(50) states that "the figure in English Botany, tab. 566, represents a luxuriantly succulent, spreading and widely branched state of the plant with thick, juicy, strongly winged stems or branches, shortly stalked, entire repandly waved subcordate leaves and larger berries, occurring in Madeira occasionally in moist or shady spots." The *S. nigrum* of Forster(26) (*S. Forsteri* Seemann), recorded for Easter Island, Tahiti, and Vavao, Friendly Islands, which, according to Seemann(68) "have berries the size of peas, and are black, and nearer to *S. villosum* than to *S. nigrum*, but with less cut leaves," may probably belong to this species. In the National Herbarium, there are specimens from the following localities, which may be referred to *S. opacum* :—

New South Wales: Kogarah (J. H. Camfield; February, 1898), Government Domains (J. H. Camfield; July, 1902; and E. Cheel; March, 1916), Medlow, Blue Mountains (A. Griffiths; May, 1916), Hill Top, Southern Line (E. Cheel; April, 1916; some berries from these plants were fed to guinea-pigs by Dr. J. B. Cleland, who states that they ate them without any ill effects), Dubbo (E.

Betche; November, 1887), Kangiara Mines, viâ Bowning (H. J. Cocks; April, 1917), Zara, viâ Hay (Miss E. Officer; February, 1904), Louth (A. Abrahams, No.315; September, 1910), Woy Woy (E. Cheel; October, 1916); Arrara, Lake Eliza (J. L. Boorman; October, 1912)

Victoria: Hawksdale (H. B. Williamson; January, 1902), Mildura (Dr. J. B. Cleland; March, 1916).

South Australia: near Quorn (J. H. Maiden; January, 1907).

Solanum pterocaulon Dunal. (Plates xxxi., xxxiii., *a*).

(*S. nigrum vulgare* simile caulibus exasperatis Dill., Elth. p.367, t.275, fig.356), *S. nigrum* var. *virginicum* L., Spec. i., p.266; Willd., Spec. i., 1053; *S. alatum* Moench, Meth., p.474 (?) *fide* Persoon, Ench., t. 224; *S. nigrum* R.Br., Prod., p.445, but not Linn.

This species, according to Dunal(**23**) and Don(**20**), is a native of South America, and of New Holland (Australia). It may be briefly described as follows:—Plants of perennial habit or at least biennial, usually upright, glabrous (or very rarely minutely puberulous), branches more or less spreading, with distinctly winged angles or margins, the winged margins minutely but distinctly jagged so that they appear somewhat serrulate or prickly, as seen in Plate xxxiii., fig. *a*. Leaves glabrous, more or less crenate-sinuated. Flowers white, with pale yellow anthers, on slender pedicels, usually in threes, or rarely four or more in the raceme. Berries at first green, afterwards shiny black, smaller than those of *S. opacum* and *S. astroites*.

Specimens in the National Herbarium are from the following localities:—New Holland (Banks and Solander, 1770), Broad Sound (R. Brown, Iter Aust. 1802-1805), Kurnell (J. L. Boorman; April, 1906), Penshurst (E. Cheel; May, 1911), Kensington (E. Cheel; May, 1917), Neutral Bay (Dr. J. B. Cleland; March, 1916), Domain (J. H. Camfield; July, 1902), Parramatta (E. Cheel; October, 1916), Emu Plains (F. W. Chapman; February, 1915), Ashfield (E. Cheel; May, 1916), Woy Woy (E. Cheel; October, 1916), Hill Top (E. Cheel; May, 1916), Wagga (E. Breakwell; October, 1912).—Queensland: Brisbane River (C.

T. White; March, 1915).—South Australia : near Adelaide (Dr. J. B. Cleland; 1898).

Specimens from plants growing wild at Ashfield and Summer Hill were fed to a guinea-pig, which ate the leaves without any ill effects. In addition to the above, plants of the following have been grown from seed, which have produced reddish or yellowish-coloured berries when fully ripe, but none of these appear to have become naturalised in Australia, so far as can be ascertained.

S. miniatum Bernh. Seeds were obtained from Madrid, Spain, and produced plants having very downy branches and leaves, white flowers, and pink or reddish berries.

S. flavum and *S. rubrum* also had pink berries, and seem to belong to *S. miniatum*.

S. ochroleucum had green berries with yellowish stripes, when fully matured.

Summary.

(1) It will be seen from the foregoing that *S. nigrum* of Europe, figured in English Botany, tab. 566, has not yet been found in Australia.

(2) That there are at least three distinct species or subspecies found in Australia and the Pacific Islands, namely, *S. opacum*, *S. pterocaulon*, and *S. astroites*.

(3) That although the evidence seems to indicate that some of the plants are harmful, no definite evidence has been furnished as to which of the three species found in Australia are harmful.

(4) That as solanine is present, at least in some of the species, it would be unwise to use the fruits for edible purposes unless it could be proved that the alkaloid was volatile, and its harmful effects destroyed by cooking.

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The names in the following list have been recorded in the various works enumerated in the Bibliography herewith, and in many cases are synonyms of *S. nigrum*, *S. opacum*, *S. pterocaulon*, and *S. astroites*, or well-marked forms or varieties, and have to be carefully considered when working with these species.

Solanum acuminatum Dun., *S. nodiflorum* var.
,, *ægyptiacum* Forsk.
,, *alatum* Mœnch = *S. pterocaulon.*
,, *angulosum* Sendt., *S. nigrum* var.
,, *astroites* Forst. f.
,, *atriplicifolium* Dun., *S. nigrum* var.
,, *Besseri* Weinm., in litt., Roem. et Schult.
,, *chenopodioides* Desc. = *S. astroites.*
,, *chlorocarpum* Spenner, *S. nigrum* var.
,, *Deppei* = *S. Dillenii.*
,, *Dillenii* Schult.
,, *Douglasii* Dun. = (?)*S. opacum.*
,, *erythræum* Dun.
,, *erythræum* Mey. = *S. nodiflorum* var. *rubrum*, according to Griseb ach.

Solanum fistulosum Rich.
„ *flavum* Dun., *S. ochroleucum* var.
„ *glabrum* Lowe, *S. nigrum* var.
„ *glabrum* Dun.
„ *guineense* Lam.
„ *guineense* Willd., *S. nigrum* var. = *supra*.
„ *hebecaulon* Lowe, *S. nigrum* var.
„ *hirsutum* Dun.
„ *hortense* Fuchs.
„ *hortense* Mill., *S. nigrum* var.
„ *humile* Bernh.
„ *humile* Bailey, *S. nigrum* var. = *S.*(?) *opacum*.
„ *humile* Ball (*non* Bernh,) = *S. patens*.
„ *incertum* Dun.
„ *judaicum* Schult. = *S. guineense*.
„ *lutea-virens* Walp., *S. nigrum* var.
„ *luteo-virens* Gmel.
„ *macrophyllum* Dun., *S. nodiflorum* var.
„ *melanocerasum* Dun., *S. nigrum* var.
„ *memphiticum* Martius.
„ *memphiticum* J. F. Gmel.
„ *miniatum* Bernh.
„ *nigrum* L.
„ *nigrum* R.Br. = *S. pterocaulon*.
„ *nodiflorum* Jacq.
„ *ochroleucum* Bast.
„ *oleraceum* Dun. = *S. astroites*.
„ *opacum* A.Br.
„ *paludosum* Dun.
„ *patens* Lowe. Raised in Northampton (England) in 1860, by Rev. M. J. Birks from Madeira seed, *vide* Lowe.
Solanum patulum Pers. = *S. Dillenii*.
„ *patulum* Willd., *S. nigrum* var. = *S. Dillenii*.
„ *patulum* Lowe.
„ *parviflorum* Badaro.
„ *petiolastrum* Dun., *S. nodiflorum* var.

Solanum procerius patulum Lam., in Dill. Elth.
,, *puberulum* Dun., *S. nodiflorum* var.
,, *puberulum* Nutt.
,, *pterocaulon* Dun.
,, *retroflexum* Dun.
,, *rigidum* Dun., *S. nigrum* var.
,, *rhinozerothis* Blume.
,, *Roxburghii* Dun.
,, *rubrum* Mill.
,, *Rumphii* Dun.
,, *suffruticosum* Dun.
,, *suffruticosum* Ball, *S. nigrum* var.
,, *triangulare* Lam.
,, *villosum* Lam.
,, *villosum* Willd., *S. nigrum* var.
,, *villosum* Mill.
,, *virginianum* L., *S. nigrum* var. = *S. pterocaulon.*
,, *virginicum* Pers.
,, *vulgare* Hegets
,, *vulgatum* Mill., *S. nigrum* var.

Thirty-four names are given as synonyms of *S. nigrum* Linn., in the Index Kewensis. Six of the names in the foregoing list are included among these.

EXPLANATION OF PLATES XXX.-XXXIII.

Plate xxx.

Solanum opacum A.Br., part of plant showing buds, flowers, and mature fruits; all reduced.

Plate xxxi.

Solanum pterocaulon Dun., part of plant; reduced.

Plate xxxii.

Solanum guineense Lam., part of plant showing matured fruits; reduced.

Plate xxxiii.

Fig. *a.*—*Solanum pterocaulon* Dun., showing portion of winged stem with denticulate or toothed margin.

Fig. *b.*—*Solanum pterocaulon* Dun., fruits, natural size.

Fig. *c.*—*Solanum opacum* A.Br., fruits, natural size.

Fig. *d.*—*Solanum guineense* Lam., (so-called "Wonderberry"), fruits, natural size.